WHAT IS CLAIMED IS:

1. An optical fiber comprising:

a radial axis;

a longitudinal axis;

a first window surface having a normal direction that is not parallel to a direction of the radial axis at the first window surface, wherein the first window surface is adapted for receiving pump radiation and transmitting the pump radiation into the optical fiber;

a second surface adapted for totally internally reflecting pump radiation received within the optical fiber; and

an active region within the optical fiber for generating radiation at a characteristic wavelength when pumped with pump radiation.

2. The optical fiber of claim 1, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 15 degrees.

3. The optical fiber of claim 1, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 45 degrees.

4. The optical fiber of claim 1, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 60 degrees.

5. The optical fiber of claim 1, wherein the normal direction of the first window surface is substantially perpendicular to the direction of the radial axis at the first window surface.

6. The optical fiber of claim 1, wherein the first window surface is substantially parallel to the longitudinal axis of the optical fiber.

7. The optical fiber of claim 1, wherein the first window surface is substantially flat.

8. The optical fiber of claim 1, wherein an angle between a normal direction of the second surface and a direction of the radial axis at the second surface is less than about 30 degrees.

9. The optical fiber of claim 1, wherein a normal direction of the second surface is substantially parallel to a direction of the radial axis at the second surface.

10. The optical fiber of claim 1, wherein the second surface is curved.

11. The optical fiber of claim 1, further comprising a third window surface having a normal direction that is not parallel to a direction of the radial axis at the third window surface, wherein the third window surface is adapted for receiving pump radiation.

12. The optical fiber of claim 11, wherein the third window surface is substantially flat.

13. The optical fiber of claim 1, wherein the active region has a transverse dimension smaller than the characteristic wavelength.

14. A fiber laser assembly, comprising:

(a) an optical fiber comprising:

(1) a radial axis;

(2) a longitudinal axis;

(3) a first window surface having a normal direction that is not parallel to a direction of the radial axis at the first window surface, wherein the first window surface is adapted for receiving pump radiation and transmitting the pump radiation into the optical fiber;

(4) a second surface adapted for totally internally reflecting pump radiation received within the optical fiber; and

(5) an active region within the optical fiber for generating radiation at a characteristic wavelength when pumped with pump radiation;

(b) a diode laser array adapted for emitting the pump radiation; and

(c) an optical element disposed between the diode laser array and the first surface and adapted for guiding pump radiation from the diode laser array to the first window surface of the optical fiber.

15. The fiber laser assembly of claim 14, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 15 degrees.

16. The fiber laser assembly of claim 14, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 45 degrees.

17. The fiber laser assembly of claim 14, wherein an angle between the normal direction of the first window surface and the direction of the radial axis at the first window surface is greater than about 60 degrees.

18. The fiber laser assembly of claim 14, wherein the normal direction of the first window surface is substantially perpendicular to the direction of the radial axis at the first window surface.

19. The fiber laser assembly of claim 14, wherein the first window surface is substantially parallel to the longitudinal axis of the optical fiber.

20. The fiber laser assembly of claim 14, wherein the first window surface is substantially flat.

21. The fiber laser assembly of claim 14, wherein an angle between a normal direction of the second surface and a direction of the radial axis at the second surface is less than about 30 degrees.

22. The fiber laser assembly of claim 14, wherein a normal direction of the second surface is substantially parallel to a direction of the radial axis at the second surface.

23. The fiber laser assembly of claim 14, wherein the second surface is curved.

24. The fiber laser assembly of claim 14, further comprising a third window surface having a normal direction that is not parallel to a direction of the radial axis at the third window surface, wherein the third window surface is adapted for receiving pump radiation.

25. The fiber laser assembly of claim 24, wherein the third window surface is substantially flat.

26. The fiber laser assembly of claim 14, wherein the active region has a transverse dimension smaller than the characteristic wavelength.

27. A method of pumping a fiber laser having a longitudinal axis, a radial axis, and an azimuthal axis, the method comprising:

producing a beam of pump radiation;

injecting the beam of pump radiation into the fiber laser in a direction such that the beam of pump radiation has a component along the longitudinal axis, the radial axis, and the azimuthal axis of the fiber laser.

28. The method of claim 27, wherein the fiber laser has a window surface having a normal direction that is not parallel to a direction of the radial axis at the first window surface, and wherein the beam of pump radiation is injected into the fiber laser through the first window surface.

29. The method of claim 27, wherein the beam of pump radiation is produced by a diode laser array.